

REMARKS

Claims 1-14 are pending.

In Paragraph No. 4 of the Action, claims 1-10, 13 and 14 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. §103 as allegedly obvious over Nishiyama et al (US 6,537,718 B2).

Applicants submit that this rejection should be withdrawn because Nishiyama et al does not disclose or render obvious the positive resist composition of the present invention.

The present invention relates to a positive resist composition, as seen in independent claim 1. The resist composition includes (a) a resin, and (b) a compound that generates an acid upon irradiation with actinic rays or radiation.

As recited in claim 1, the resin (a) is decomposed by the action of an acid to increase its solubility in an alkali developing solution. The resin contains a structural unit having a group represented by formula (X) shown in claim 1, and has a weight average molecular weight of not more than 5,000. In addition, the resin contains an acid decomposable group in an amount of not more than 40% based on the sum total of the number of acid decomposable groups and the number of alkali-soluble groups not protected with acid decomposable groups.

In the Response Under 37 C.F.R. § 1.116 filed February 14, 2006, Applicants explained why Nishiyama et al does not disclose or render obvious the positive resist composition of the present invention.

Specifically, Applicants pointed out that while certain of the repeating units in certain of the formulas in Nishiyama et al would satisfy the limitations of formula (X) in present claim 1,

none of the resins of Nishiyama et al presently relied upon by the Examiner (that is, resins (IV-22) and (IV-24) of Nishiyama et al) or previous relied upon (that is, the resins of formulas (IV-35), (IV-36), (IV-37) and (IV-43)) were employed in the working Examples of Nishiyama et al.

An additional distinction over Nishiyama et al is the requirement found in present claim 1 that the resin must have a weight average molecular weight of not more than 5,000.

The Examiner has pointed out that the molecular weight of the taught resin in Nishiyama et al preferably is in the range of 2,000 to 300,000, citing column 38, lines 1-17 of Nishiyama et al. In this regard, the Examiner asserts that “Since the data point of 2,000 is clearly disclosed as the lower end of the taught range . . . , one skilled in the art would immediately envisage Nishiyama’s resin (B) to have the Mw of 2,000, and thus, the prior art teaches present limitation as to the wt average molecular weight being not more than 5,000.” At page 4 of the present Action, the Examiner has added a citation to In re Wertheim for the proposition that “the disclosure in the prior art of any value within a claimed range is an anticipation of that range.”

Applicants respectfully disagree. Nishiyama et al does not anticipate the recitation in present claim 1 that the resin (a) has a weight average molecular weight of not more than 5,000.

With due respect, the Examiner’s understanding of the law with respect to anticipation where overlapping ranges are concerned is wrong. The Wertheim case relied upon by the Examiner merely stands for the proposition that the disclosure of a species in the prior art will anticipate a genus. The Examiner is interpreting Wertheim as standing for the proposition that the disclosure of a range is a specific disclosure of the endpoints of that range, which is incorrect as a matter of law.

The Federal Circuit recently addressed this exact issue in Atofina v. Great Lakes Chemical Corp., 78 USPQ2d 1417 (Fed. Cir. March 23, 2006). In Atofina, the CAFC expressly held that “the disclosure of a range of 150 to 350 C does not constitute a specific disclosure of the endpoints of that range, i.e., 150 C and 350 C, as Great Lakes argues.” Id. at 1424. The court stated: “The disclosure is only that of a range, not a specific temperature in that range, and the disclosure of a range is no more a disclosure of the end points of the range than it is of each of the intermediate points.” Id.

The Federal Circuit also expressly held that the trial court “clearly erred” in finding that the disclosure in the prior art of an overlapping range anticipated a range recited in the patent at issue:

“The district court also clearly erred in finding that the claimed oxygen to methylene chloride molar ratio of 0.1 to 5.0 percent was disclosed in JP 51-82206. JP 51-82206 discloses an oxygen to methylene chloride ratio of 0.001 to 1.0 percent that overlaps but does not fall within the range of ratios claimed in the ‘514 patent. Moreover, the disclosure of a 0.001 to 1.0 percent range in JP 51-82206 does not constitute a specific disclosure of 0.1 percent to 5.0 percent, as Great Lakes asserts. Once again, although there is a slight overlap, no reasonable fact finder could determine that this overlap describes the entire claimed range with sufficient specificity to anticipate this limitation of the claim. The ranges are different, not the same. Indeed, the lower end of the ratio in the reference differs by a factor of one hundred from what is claimed. In addition, the disclosure of a 0.001 to 1.0 percent range is not a disclosure of the end points of that range. Thus, there is no anticipation.”

Id.

Here, the Examiner has asserted that Nishiyama's disclosure of an Mw range of 2,000 to 3,000,000 anticipates the recitation in the present claims of an Mw of 5,000 or less. The Examiner's position is incorrect, as a matter of law. See Atofina v. Great Lakes Chemical, supra. On this basis, reconsideration and withdrawal of the §102 anticipation aspect of the rejection are respectfully requested.¹

Turning to obviousness under section 103, in addition to the above distinctions, present claim 1 requires that the resin must contain an acid decomposable group in an amount of not more than 40% based on the sum total of the number of acid decomposable groups and the number of alkali-soluble groups not protected with an acid decomposable group.

In this regard, the Examiner states that Nishiyama teaches (column 24, lines 61-65) that the molar ratio of the repeating unit of the formula (IV) to the repeating unit of the formula (V) present in his resin is *more preferably* from 10/90 to 40/60. Thus, the Examiner reasons, Nishiyama teaches the present limitation as to the amount of the acid decomposable group being not more than 40%.

In this regard, Applicants submit that the present invention achieves particularly specific effects by selecting a specific molecular weight and a specific ratio of acid decomposable groups, and thus the present invention which specifies (1) polymer, (2) molecular weight, and (3) ratio of an acid decomposable group is not taught at all by the general description regarding the ratio of the acid decomposable group as disclosed in Nishiyama et al.

¹ A copy of the Atofina case is attached for the Examiner's convenience.

As explained in previous Responses, the claims of the present application define both the weight average molecular weight and the “protection” rate in specific ranges, so that the positive resist composition of the present invention provides or generates specific effects in terms of improvements in *in vacuo* PED in cases of drawing with an electron beam. Nishiyama et al. ‘718 does not disclose, foreshadow or suggest these improvements, nor does Nishiyama et al. disclose or fairly suggest the specific positive resist composition of the present invention.

In this regard, looking at the comparisons in the present specification, the Examiner has noted that Example 1 and Comparative Example 1 use different types of polymers, and different types of photoacid generators; that Comparative Example 2 does not use component C and also uses a different type of nitrogen-containing basic compound compared to Example 1; and that Example 1 and Comparative Example 3 use different types of polymers, and also Comparative Example 3 does not use component C and uses a different type of nitrogen-containing basic compound as compared to Example 1.

In response, Applicants submit herewith a Declaration Under 37 C.F.R. § 1.132 of Mr. Koji Shirakawa, the first-named inventor of the present application. Mr. Shirakawa’s Declaration addresses the Examiner’s concerns, provides evidence of unexpectedly superior results and supports the patentability of the present invention.

As explained in his Declaration, Mr. Shirakawa conducted an experiment to demonstrate the unexpectedly superior results obtained with the present invention. Example 9 of Nishiyama et al, which uses an alkali-soluble resin B-5 obtained from a base resin having an Mw of 17,000, was evaluated in the same manner as described in the present application. The results are shown as Comparative Example 1’ in Tables A and B at page 3 of Mr. Shirakawa’s Declaration.

In Examples 1 and 2 in the Tables, an alkali-soluble resin B-5' and an alkali-soluble resin B-5'' were prepared, respectively, based on the working examples of the present invention by using base resins having Mw's of 2,500 and 4,000, respectively, in place of the base resin having an Mw of 17,000. Each of the alkali-soluble resins B-5' and B-5'' obtained from the base resins having molecular weights of 2,500 and 4,000, respectively, had Mw's nearly equal to the Mw of their respective base resin. Thus, the alkali-soluble resins B-5' and B-5'' are within the presently recited range for the weight average molecular weight, Mw. Examples 1 and 2, like Comparative Example 1', were evaluated in the same manner as described in the present application.

The results are shown in Table B at page 3 of Mr. Shirakawa's Declaration. As seen in Table B, the samples embodying the present invention were excellent in each of sensitivity, resolution, pattern profile, and *in vacuo* PED property, in comparison to Comparative Example 1' corresponding to Nishiyama et al. As shown in the Declaration, the present invention achieves superior effects by selecting a specific molecular weight and a specific ratio of acid decomposable groups of the polymer having a group represented by formula (X). The technical ideas of the present invention and Nishiyama et al are different, and the present invention and Nishiyama et al differ both in terms of objects to be solved and effects.

In view of the above, Applicants respectfully submit that the positive resin composition of the present invention is novel and patentable over Nishiyama et al. '718.

Reconsideration and withdrawal of the §§102/103(a) rejection based on Nishiyama et al '718 are respectfully requested.

Response Under 37 C.F.R. § 1.111
U.S. Appln. No.: 10/812,074

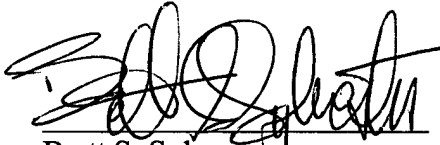
In Paragraph No. 5 of the Action, claims 11 and 12 are objected to as being dependent upon a rejected base claim. Applicants note with appreciation that these claims would be allowable if rewritten in independent form.

In view of the response to the rejection of claims 1-10 and 13-14 based on Nishiyama et al, Applicants respectfully submit that claims 11 and 12 are allowable in their present form.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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